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ABSTRACT

The motivation of students to volunteer to participate in research studies was explored in two studies. The first study explored the motivation of 300 introductory psychology students at a large midwestern university to volunteer for research participation when one exam point was offered for each hour of participation. Study two, which was conducted at a different university, also offered extra credit for participating and elicited students' reasons for volunteering and information on their grade point average and expected grade in introductory psychology. Students who participated did not appear to differ in demographic variables from nonparticipants, but there were differences in grades attained by participants and nonparticipants. Volunteers in the extra credit incentive system appeared to be mostly the top students and students who are motivated by grades that are perceived as being low. More students who did not need the credit to attain a high grade participated in research anyway. Since students with high motivation to achieve may participate in research more than students with low achievement motivation, the generalizability of research findings may be limited. It is noted that extra credit for research participation may also be a source of grade inflation. (SW)

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Introductory Psychology Grades and Volunteers for Extra Credit

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Introductory Psychology Grades and Volunteers for Extra Credit

For research to be of value, the results need to be generalizable to people other than the subjects of a particular study. This problem is of special of concern when the research topic is human behavior, because various factors in the research situation may influence the subjects' motivation to perform naturally. To the extent subjects' motivation is not representative of the general population, the generalizability of the research is limited. Therefore, it is important to understand all we can about the possible interaction of the research situation and the motivation of volunteer subjects.

If the motivation of research subjects is substantially different from that of the target population, the generalizability of the research suffers. Such motivational differences could appear in two ways. First, the motivation of volunteer research subjects in general, may not be representative of the general population. Second, recruitment techniques, such as the extra credit incentive, may attract more subjects with a particular type of motivation. This may be representative of how the general population would react to an extra credit incentive, but would still limit the generalizability of the results. Thus, it is important to understand the motivation of the subjects to volunteer for research participation.

Motivational Issues

A number of important questions have been raised concerning the effects of subjects' motivation to participate in psychological research. Some issues have involved characteristics of participants and nonparticipants (Bender, 1981; Nottingham, 1972), personality characteristics of volunteers and nonvolunteers (Burns, 1974; Silverman, 1977), and the effects different roles adopted by research subjects may have on the results (Carlston & Cohen, 1980; Shulman & Berman, 1975; Silverman, 1977; Weber & Cook, 1972). Other issues involved related questions of the effects of different recruitment techniques (Cox & Sipprelle, 1971; Dixon, 1978; Evans & Donnerstein, 1974; Hom, 1986; Leak, 1981; Menges, 1973; Miller, 1981; Royce & Arkowitz, 1977; Silverman, 1977; Wagner & Schubert, 1976) and the educational value of research

participation (Britton, 1979; Davis & Fernald, 1975; Hom, 1986; Leak, 1981). These issues will be discussed individually below, however, it should be noted that each issue is related to many of the others. It is impossible to treat them as fully independent factors.

Personality

If the personalities of research participants are found to be different from those of the nonparticipants, the generalizability of the results may be limited. Previous research generally supports the finding of personality differences between participants and nonparticipants, and between volunteers and nonvolunteers. Nottingham (1972) found research participants to be more trusting. Burns (1974) described those male subjects who volunteered for participation without incentive as having less subtle defensiveness, and being more ambitious and resourceful than nonvolunteers. Non-incentive volunteer females were described as being "less serious, industrious, conforming; less calm, patient, practical . . . ;more independent, self-reliant, forceful and foresighted . . . "(p. 162). Silverman (1977) found that subjects who 'volunteered' for research participation were more intelligent, better educated, higher in a need for approval, more sociable, more arousal seeking, older, less conventional, and less authoritarian than nonvolunteers.

Evans & Donnerstein (1974) and Hom (1986) found personality differences between subjects who volunteer early in the term versus those who volunteer late. Early volunteers tended to be more academically oriented, have a more internal locus of control, score higher on a subscale of the WAIS (Evans & Donnerstein, 1974) be more intrinsically motivated and be more resistant to the detrimental reward effect (Hom, 1986). These results suggest that differences in the motive to participate may indeed affect performance in some areas.

Subjects' Perceived Roles

Shulman & Berman (1975) were interested in determining subjects' expectations concerning the experimenters and the research experience. They found subjects expected the experimenters to be coldly professional, detached, and interested in the research.

Subjects also expected themselves to be faithful to the requests of the researchers, nervous, and suspicious. Shulman & Berman found that subjects' own expectations and the experimenters' behavior will influence subjects' perception of the experimenter.

Researchers have suggested that some subjects play subject roles, which may reflect some subjects' motives for participation in research (Carlston & Cohen, 1980; Weber & Cook, 1972). Weber & Cook defined four possible subject roles; the good subject, the faithful subject, the negativistic subject, and the apprehensive subject. The good subject attempts to behave in a manner that will support the perceived experimental hypotheses. The faithful subject tries to carefully follow all the instructions and not let any personal biases color the responses. The negativistic subject appears to attempt to disprove the perceived hypotheses. Finally, the apprehensive subject is very sensitive to task and measurement demands because of having his or her performance analyzed. All of these roles, if they exist, would bias the results.

After reviewing the research on subjects' roles and demand characteristics, Weber & Cook concluded that there was consistent support for the existence of the apprehensive subject. Both the good subject and negativistic subject roles are confounded with evaluation apprehension. The faithful subject may appear if subjects do not know the hypothesis and evaluation apprehension is low. Weber & Cook conclude that the apprehensive subject role may threaten the validity of some research.

Carlston & Cohen (1980) employed a role-playing technique to determine the effects of the roles suggested by Weber & Cook. Although, Carlston & Cohen found support for the existence of these roles, they did not feel these roles were adopted by enough subjects to substantially bias results. Most subjects adopted a control role which was not affected by the experimental hypotheses.

Recruitment Procedures

One of the more popular issues in research participation has been the effects of different recruitment techniques in influencing the type of subjects who participate. The most popular recruitment technique appears to be requiring participation with alternatives for those who do not wish to participate

(Menges, 1973, Miller, 1981; Silverman, 1977). The second most popular technique involves giving subjects extra course credit (Miller, 1981; Silverman, 1977). Therefore, most of the subjects have been students in introductory level psychology classes. The different recruitment procedures vary with respect to the amount of coercion involved. Even asking subjects to volunteer may have some coercive elements if the subjects see the experimenter as having some control over their grades. Conflicting data concerning the effects of coercion on participation have been reported. However, Miller (1981) reported that the trend appears to be towards the use of less coercive methods.

Some researchers have reported that subjects recruited by different techniques also perform differently. Cox & Sipprelle (1971) reported differences in task performance as a function of the volunteer status of the subjects, with subjects who were required to participate performing the worst. However, this result was attenuated by the addition of a small monetary reward for performance. They suggested that subjects who are required to participate may harbor some resentment and lack motivation to perform well. Expressing similar concerns, Menges (1973) suggested one possible motive of subjects who are required to participate in research was to "get it over with" (p. 1033).

Conflicting results have been reported elsewhere. Wagner & Schubert (1977) and Burns (1974) were studies in which the personality characteristic of volunteers and non-volunteers were compared. The researchers concluded that offering incentives, extra credit or pay, may actually increase the representativeness of the research sample. Furthermore, Dixon (1978) found no difference in learning task performance between volunteers and paid subjects. However, totally volunteer subjects were more hostile towards and frustrated with the experiment. Finally, Royce & Arkowitz (1977) suggest "differences among recruitment procedures may be unimportant if high subject motivation is ensured . . ." (p. 64).

Perceived Value of Participation

Although many universities report that research participation is educationally valuable (Leak, 1981) very few actually take the effort to measure the value (Miller, 1981) or to see if subjects are prompted to volunteer by the perceived educational value. Britton (1979) did measure subjects' perception of the educational value of participation, as well as their perception of how they were treated overall. The overall ratings of the research experience were high, but the lowest rating was given to the perceived educational value. This suggests that participation is either not valuable or that the value is not perceived by the subjects. Either interpretation is cause for alarm.

Experiment One

If subjects do not perceive research participation to be of great educational value, it would be instructive to know why they participate when given the opportunity. This study was conducted to attempt to unobtrusively determine the motivation of students in an Introductory Psychology class for volunteering for research participation when one exam point was offered for each hour of participation.

Method

Subjects

The class records of 300 Introductory Psychology students from a major midwest university were randomly chosen for the source of data.

Procedure

The records consisted of the exam scores, final grade, major, gender, year, and amount of extra credit attempted. No limit was put on the amount of extra credit students could complete. However, students were allowed to raise their grade by only one grade level. Grades were assigned by a norm-referenced system whereby the top 15% of the scores received As, the next 25% were Bs, the next 45% were Cs, the next 10% were Ds, and the last 5% were Fs. Chi Squares were used to look for relationships between these variables.

Results

The mean hours of research participation by all students who completed some extra credit was 6.1 hours. This compares to about 4 hours for the average participation found by Miller (1981). The mean hours for those students who raised their grade was 10.87, while the mean for those who did not was 4.3.

Chi square analyses for various variables and whether or not students completed research participation revealed no significant differences for year, major, gender, or proximity to a final grade cutoff.

A significant chi square ($\underline{X}^2 = 20.5237$, $df = 4$, $p < .01$), was found for the two-way classification of grade prior to extra credit and whether or not students did extra credit. Cramer's statistic yielded a value of .262. Examination of the expectancy table in Table 1 indicates that students who would receive an A or B

Insert Table 1 About Here

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without extra credit participated in more research than would be expected, while students who would receive a C or an F completed less.

A significant chi square ($\underline{X}^2 = 28.668$, $df = 1$, $p < .01$), was found for the two way classification of amount of extra credit completed and whether or not it made a difference in the final grade. The four-fold point correlation was .44. An examination of the expectacies in Table Two indicate a greater number of

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Insert Table 2 About Here

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students for whom the research participation raised their grade completed over 6 hours of research, while a greater number of students for whom participation did not raise their grade completed six hours or less.

Discussion

Although students who engaged in research participation did not appear to differ in demographic variables from those who did not participate, there were differences for grades attained. More students who did not need the credit to attain a high grade participated in research anyway. This could be interpreted in terms of some motivation to achieve. These results seem to support the findings of Evans & Donnerstein (1974) and Hom (1986). Offering extra credit points for research participation may be a more salient incentive for subjects with a strong motivation to achieve than for students with a poorer motivation to achieve. It is commonly accepted in motivational areas that students with higher levels of achievement motivation perform differently than students with lower levels. Therefore, the generalizability of research conducted using volunteers who are awarded extra credit may be limited.

Experiment Two

If offering extra credit is a strong incentive for students who are motivated to achieve, students' reasons for volunteering may reflect this motivation. This experiment was conducted at a different university than the one used in Experiment One, in order to extend the suggestion that offering extra credit may be a strong incentive for students who are motivated to achieve. The extra credit policy of this psychology department was similar to that of the department in Experiment One.

Subjects volunteered to participate in research on the use of feedback on classroom-like tests. During part of the debriefing, subjects were asked to respond to a questionnaire concerning their reasons for volunteering and other variables such as their grade point average and expected grade in Introductory Psychology. It was expected that subjects would list a desire to maintain a high grade or to raise a low grade as the most frequent reasons for volunteering. It was also expected that more reasons involving low grades would appear from subjects who volunteered later in the semester.

Method

Subjects

The responses to the debriefing interview of 41 male and female Introductory Psychology students from a medium-sized midwest university were used as the data. Two subjects did not give codeable responses to the item concerning their reasons for participation. Therefore, only the responses from 39 subjects were used in the final analysis.

Procedure

Subjects volunteered for an experiment involving learning from feedback. The procedure for gathering subjects involved subject self-selection by signing posted calls for particpation. Each posted call briefly described the research and listed available times. For this research three different calls were posted at two week intervals. The first call was posted one to two days after the subjects' first exam. The remaining calls were posted at two week intervals.

During part of the debriefing, subjects were asked to respond to a brief questionnaire. The first item concerned subjects' reasons for volunteering for research participation, and is reprinted below. Another important item asked the subjects to report their current grade point average, current grade in Introductory Psychology, and expected grade. Many subjects did not provide their current grade point or expected grade. However, all subjects provided their current grade in Introductory Psychology. No attempt was made to verify these reported grades

1. Circle the response that best describes why you volunteered for being a research subject.
a. I am interested in the topic of the research.
b. I am interested in Psychology.
c. Volunteering is one option in a requirement.
d. I want to try to raise a 'low' grade.
e. I want to try to keep a 'high' grade.

Results

A chi square test was performed to discover if subjects used more response concerning grades than the other three responses. The expected frequencies were set at 50% of the responses. The chi square was significant ($\underline{X}^2 = 9.2564$, df = 1, $p < .005$), with 29 subjects grade related reasons and 10 choosing the others.

Chi square tests of independence were used to test the relationships between time of volunteering and reason for volunteering. The chi square for the relationship between time and 'low' grade versus all other reasons was significant ($\underline{X}^2 = 8.1405$, df = 2, $p < .02$). Cramer's statistic yielded a value of .4569. Subjects who volunteered for the first session of testing used trying to raise a 'low' grade less frequently than other responses. The observed and expected frequencies are in Table 3. Subjects who

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Insert Table Three About Here

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volunteered for the last session used this response more frequently than the other responses. However, it should be noted that some of the cells contained very few responses. The chi square for the 'high' grade response and time of volunteering was not significant.

Discussion

The first hypothesis, that subjects would be strongly motivated by their perceived grade was supported. However, other alternatives that did not appear on the questionnaire may have been chosen had they been included. For example, subjects may have thought participation in research for extra credit would be easier than any alternatives offered. The hypothesis that later volunteers would be more motivated by a desire to raise a perceived low grade was supported. Whether or not their grades were actually lower is not clear. Although the average reported Psychology grades declined for the later volunteers, the differences were nonsignificant.

General Discussion

This research sought to examine two things. First, it was suggested that aspects of the research situation may attract a type of subject whose motivation to perform does not represent that of the 'student on the street', thus limiting the generalizability. Second, it was considered possible that whether or not the motivation of subjects was representative of the 'normal' population, the extra credit incentive may attract a large amount of achievement-oriented subjects. It can not be stated that the results indicate the motivation of subjects who volunteer is not representative of the 'normal' population, for no comparisons were made to nonvolunteer students. However, it does appear that one prime motivation for subjects to volunteer, when offered extra credit points, is in the points and their effects on grades. This may limit the generalizability of research based on the extra credit incentive to the more achievement-oriented populations.

These results indicate two possible problems which may occur when departments offer extra credit to students for participation as research subjects. The first problem is related to the subtle coercion of offering extra credit. It appears that this type of incentive may not attract a representative sample of subjects. The lack of representativeness appears to occur both in the motivation of subjects who volunteer and in the the time during the semester in which subjects with differing motivations volunteer. The second problem involves the lack of perceived educational value in research participation. If certain types of students are more influenced by the extra credit incentive and the experience of participating in extra credit is of low educational value, then some form of grade inflation may be occurring.

Departments may want to consider whether or not giving students extra credit for participating in research is fair to all students. The subtle coercion of the extra credit incentive appears to attract a disproportionate amount of A and B students. If the more able students also volunteer relatively early and there are fewer opportunities for participation than there are students desiring extra credit, researchers may find differences in their experimental results are

dependent on when they conduct the research. Indeed, this has already been reported (Hom, 1986).

Not only does the offering of extra credit appear to affect which and when students volunteer, but it may have an effect on the validity of the grades themselves. Volunteers in an extra credit incentive system appear to be mostly the top students and students who are motivated by grades that are perceived as being low. To the extent that extra credit actually raises students grades, extra credit systems may be of more benefit to certain types of students, i.e., the more achievement-oriented. Drawing from the same population used in Experiment 1, Bender (1981) found that 47% of the As awarded to the sample in Experiment One were As because of extra credit. In light of the lack of a demonstrated educational value, extra credit for research participation may be a source of grade inflation.

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Table 1. Expected frequencies for grade before extra credit and completion of extra credit.

Extra Credit	Grade				
	A	B	C	D	F
Completed	34	45	44	16	4
	27.17	35.27	52.19	16.21	11.44
	6.83	9.73	-8.19	-.21	-7.44
Not completed	23	29	67	18	20
	29.83	38.73	58.09	17.79	12.56
	-6.83	-9.73	8.91	.21	7.44

Note. The first number is the observed frequency, the second is the expected frequency, and the third is the difference.

Table 2. Observed and expected frequencies for number of hours of extra credit and effect on grade

Grade Change	Hours	
	Over 6	6 or less
Yes	28	13
	14.13	26.87
	13.87	-13.87
No	23	84
	36.87	70.13
	-13.87	13.87

Note. The first number is the observed frequency, the second is the expected frequency, and the third is the difference.

Table 3. Observed and expected frequencies for time of volunteering and reason

Session	Reason		Mean Grade
	'Low' Grade	Others	
First	4	9	3.08 (n=13)
	7	6	
	-3	3	
Second	8	8	2.31 (n=16)
	8.62	7.38	
	-.62	.62	
Third	9	1	2.00 (n=10)
	5.38	4.62	
	3.62	-3.62	

Note. The first number is the observed frequency, the second is the expected frequency, and the third is the difference.